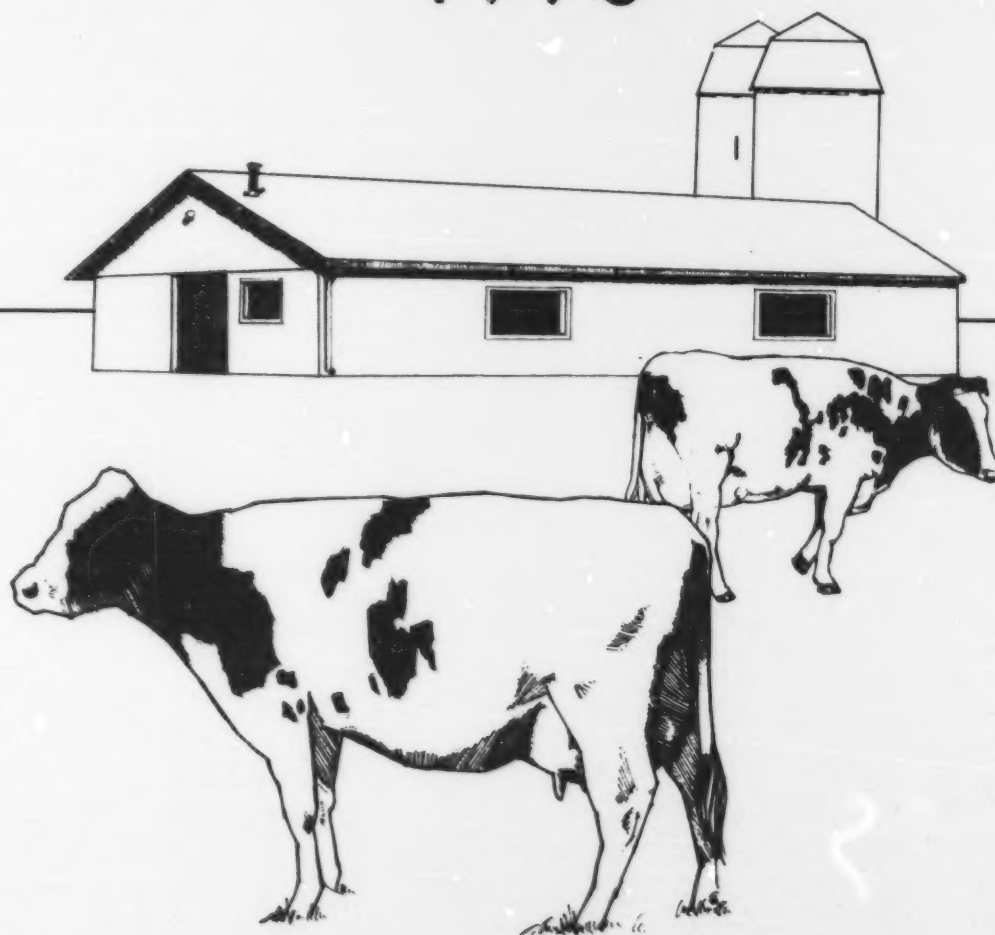


ECONOMICS OF MILK PRODUCTION □ 1990



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1991 09 1.4M

92-01324/

ECONOMICS OF MILK PRODUCTION
IN ALBERTA, 1990

Volume 50

By
Kathleen MacDonald-Date

Production Economics Branch
Economic Services Division
Alberta Agriculture
June 1991

FOREWORD

Pricing of fluid milk in Alberta is regulated by the Public Utilities Board (PUB). The Production Economics Branch conducts an annual study of dairy production costs and returns in Alberta to assist the PUB in administering fluid milk prices. This annual Dairy Cost Study was introduced during World War II and is now recognized by dairymen, consumers and the PUB as the primary reference for setting fluid milk prices.

In addition to the Dairy Cost Study, the branch had developed a computerized formula which monthly monitors producer costs. The formula enables the PUB to make more frequent adjustments to the producer price in response to changes in production costs during the year. Further adjustment to the producer price can be made when the annual Dairy Cost Study is completed.

The cost of producing fluid milk increased by 2.2 percent in 1990 in contrast to 9.6 per cent in 1989. Relatively stable feed costs, and declining interest and capital costs moderated increases in labour and other operating expenses. The fluid milk (Class 1) price increased by 3.0 per cent but the blend price of fluid and industrial milk received by the sample producers only increased by 1.0 per cent. As a result, the return to equity fell by 51 cents per hL and the annual return to equity fell from 12.8 per cent in 1989 to the 11.7 per cent in 1990.

Dr. Carlyle Ross, Head
Production Economics Branch

ACKNOWLEDGEMENT

This report was prepared from farm records of a selected number of fluid milk producers in Alberta who voluntarily participated in this project. Their participation was greatly encouraged by the Alberta Fluid Milk Producers' Association. The Alberta Dairy Control Board provided the financial compensation to the participating producers. Allan Presiznuk from Production Economics Branch collected and assisted with the computerization of the farm data; he also maintained personal contact with the producers throughout the year.

The computer program was converted from mainframe to personal computer by Julie Johnson and modified by Son Nguyen. Rudy Susko provided assistance during these changes. Assistance was also provided by Darren Chase during data verification and data entry.

Kathleen MacDonald-Date

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I. INTRODUCTION

This study is an annual economic analysis of milk production on Alberta farms. Prior to 1974 the findings of these studies were used as the documented evidence at the Public Utilities Board hearings to set the producer price. Although a formula pricing system was adopted in November 1974, the significance of this study in the overall pricing mechanism remains undiminished.

More specifically the objectives of the study are:

- to provide a continuing account of the costs and economic conditions encountered in the production of fluid milk in Alberta.
- to annually monitor the performance of the fluid milk formula pricing.
- to use the findings as a basis for the revision in the formula price.
- to provide the data for extension use, for example, farm management.
- to provide the participating dairy farmers with a personal business analysis for management purposes.

The cost of production account is a vital economic indicator in milk pricing because of the supply management nature of the industry.

II. METHOD OF ANALYSIS

Many approaches may be used to establish the cost of production on the farm. The approach taken in this study is to show the actual cost outlays taken from the farm records for a given production year. A computer program is utilized to summarize the data and calculate the weighted group averages.

The study emphasizes the overall provincial situation supported by the regional data. Since the study is annual and ongoing, the current year is compared with the previous year to make the results more meaningful. Using this approach, the information is expressed in production units such as per hectolitre of milk and per cow.

Preliminary quarterly analyses are made during the year to observe seasonal effects. However, emphasis is on the full year's operation.

1. Enterprise Identification -- There are many accounting approaches for calculating the farm cost of producing fluid milk. Some use the total farm approach, with dairy costs intermingled with others. Others use the different imputed cost items such as operating interest cost or management charge. In Alberta the dairy enterprise is defined as all activities associated with milking cows, dry cows and young dairy stock. In most cases, the dairy operator uses home-grown feed; the inputs of production are allocated to the dairy enterprise and the total farm according to the actual use. Consequently, the final costs of producing milk are the true costs associated only with milk production.
2. Inventory adjustment -- Since the cost of raising young dairy stock is included in the cost of milk production, the total income includes net cattle sales and net inventory increases to show the herd growth. The cattle inventory increases are determined by subtracting the beginning year inventory from the year-end inventory. The gross income is thus composed of milk sales and inventory adjustment. If the inventory adjustment per hectolitre of milk is excluded from the income the

result is the blend price and subsidy received for milk (less the levies).

3. Home Grown Feed -- The hay grown on the farm and fed to dairy livestock is valued at regional values of hay in the stack on the farm; feed grain is valued at elevator prices provided by the Alberta Grain Commission. Although hay and grain could be grown on the same farm, both are considered to be purchased from the crop enterprise. The total value of home grown feed is determined by applying the regional price to the actual quantity fed. The procedure adequately compensates for the production cost of growing home feed. The cost of purchased feed is accepted at the actual value spent each month.
4. Value of Investment and Depreciation -- The cost of production and other relevant data from this report are supposed to reflect the average conditions in the industry. The value of depreciation is based on the original value of buildings and machinery. There is also a need to estimate the current market value of the facility to determine the equity position. The market value is computed from the original value of dairy capital by updating with the inflation factors and then depreciating according to the number of years in use. This value is used for calculating the return to equity. The age of the facility is indicated by the sample of participating producers representing the total industry. The farmland is not considered as a dairy investment. Only the acreage for pasture, dairy buildings and corral location is included in the dairy. The dairy livestock inventory is valued at the prevailing market prices at the beginning of the year.
5. Imputed Costs -- There are two basic alternatives to value the economic well being of the farm enterprise. A. to determine the return to family labour including the operator labour input, and B. to determine the return to equity invested in each particular enterprise. The methods, as identified in Table 1, are quite compatible and in each case some major assumptions must be made. In alternative A where the residual is return to family labour, the equity interest must be

imputed in order to arrive at the total cost of production. The actual residual can then be measured in terms of dollars per hour of labour. On the other hand, using alternative B, the value of family labour must be imputed since there is usually no value attached to this input. In both alternatives, where a management cost is not included, the residual includes the return to management.

TABLE 1 ALTERNATIVE RETURNS

A. LABOUR	B. CAPITAL
a) Gross Income	a) Gross Income
Feed	Feed
Other	Other
Hired Labour	Hired Labour
<u> </u>	<u>Family Labour (Imputed)</u>
b) Operating cost	b) Operating Cost
Rent	Rent
Depreciation	Depreciation
Paid Interest	Paid Interest
<u>Equity Interest (Imputed)</u>	<u> -</u>
c) Capital Cost	c) Capital Cost
Return to Family Labour	Return to Equity

In this study the principles of alternative B are used, i.e. the objective is to determine the percentage return to equity. The imputed value of family labour is included in the operating or variable costs. This is more practical for a number of reasons: i) incorporated farms usually allocate total labour expenses including family, ii) in reality the operator is using money during the year for living expenses and thus the imputed family labour value is compensating for this, iii) imputed interest or opportunity cost on equity, used in alternative A is a controversial issue in a period of persistent inflation of capital assets. In this study no management cost has been included. This would have to be inputted and its evaluation could also be quite controversial. One possible method

would be to allocate a specific percent of gross return to management. Another would be to allocate a portion of labour hours to management and evaluated these hours at an imputed rate.

The charges for rent are included in the cost of capital. The capital cost in this context represents the cost of ownership of resources. If resources are rented there is a charge for their use; on the other hand, if resources are owned the owner must bear the cost of depreciation and interest on debt. For group averages such classification of variable (or operating) and capital cost is very suitable.

- a) Operator and family labour: the operator's actual labour may vary from almost nil on some dairy farms to the total input of labour on others. Our procedure has been to obtain a statement of the operator's labour in hours per month, then apply the rate paid for full time dairy labour (including room and board).

In determining the hourly value, 2,500 hours is considered to be the working time for one man-equivalent in a 12-month period. By this method, it is felt that the process of valuing the operator's labour is equitable. This method is preferred over leaving it as a residual because of the great variability in labour time between operators. Family labour is evaluated similarly to the above, but with different wage rates according to age and working responsibilities. Partners, spouses and other family members over 18 years old are evaluated at the same rate as the operator. Family members under 18 years old are evaluated at a lower rate.

- b) Interest on Capital: the actual interest paid on existing liabilities is included in the capital cost. To obtain this value, the participating producers were asked to report their outstanding liabilities and the interest rates they paid. This method is more accurate than reporting the annual interest payment sum. The total operating cost, plus the capital cost, account for total enterprise outlays and if subtracted from the gross income, the bottom line

residual is the return on equity including management. The return on equity is not imputed but is left as a residual to measure the economic well-being of a farmer. If this residual is expressed as a percentage of the equity capital, then the actual return on equity could be compared with some alternative opportunity. For example, it could be compared with income expected from Canada Savings Bonds or term deposits. A more meaningful comparison would be to compare the percent return to equity adjusted for management or risk with less risky alternatives as indicated above.

6. The production cost concept: The concept of cost accounting in farming is not the same in all provinces. In Alberta, the production cost concept shown in Figure 1 is used.

FIGURE 1
PRODUCTION COST CONCEPT

Farm Sales				Inventory Adjustment		
Gross Income						
Feed Costs	Labour Costs	Other Costs	Rent	Depre- ciation	Interest Paid	
Operating Costs			Capital Costs			Return To Equity
Production Costs						
			Debt Repayment Capacity			

III. DATA COLLECTION

In order to obtain accurate dairy information from primary milk producers, all producers on the study are required to complete a detailed questionnaire of their dairy production activities each month and a detailed questionnaire of their dairy investment once for the year. These are shown in Appendix D of this report.

Research assistants collect the data, monitor the monthly collection and audit the data. This procedure ensures promptness in data collection and a minimum of recording error. The information is then entered into the computer. The computer output shown in Appendices A, B and C serves as supporting data for the report.

The analysis is based on data from fluid milk producers. Consequently, the results indicate the cost level of producing fluid milk rather than industrial. The cost level for industrial milk might differ from fluid, but the difference is not substantial.

Sixty-four dairy producers across the province submitted business information for the calendar year 1990. Two regions are recognized for the purpose of analysis. The region lying north of 39th township is called Northern Alberta and is represented by 42 producers; the region south of the 39th township is referred to as Southern Alberta and is represented by 22 producers. The producers submitted business accounts throughout the year.

Sample

While the number of participants can change because of unforeseen circumstances, the sample size is determined statistically every year. It was established that the variance of cost of producing milk in the population

of fluid milk shippers was \$37.50/hL. The estimated cost was assumed to be within a \$3.00 range. The sample size was then determined by the formula¹.

The study was designed to represent a cross-section of the producers by the milk quota size. The provincial fluid milk shippers were arranged according to the quota size from largest to smallest in each of the two regions, Southern Alberta and Northern Alberta. The sample was selected by systematic sampling to provide better representation of the population. The average quota and herd size of the sample were 850 litres and 66 cows respectively. The sample size of 88 producers was determined to be statistically sufficient to represent the total population of fluid milk shippers with an expected drop off taken into account. Out of that group 64 producers completed reports for the 12-month period needed for the study. Some characteristics of the sample are shown in Table 2.

TABLE 2 1990 SAMPLE CHARACTERISTICS

Years in Dairy	Total Sample	Indebtedness		Herd Size (# of cows)	
		<30%	>30%	<40	>40
----- percent of the sample -----					
Less than 10	31	6	25	5	26
More than 10	69	38	31	9	60
Total Sample (%)	100	44	56	14	86

1
$$n = \frac{4 \times s^2}{L^2}$$

Where: n is sample size
s is standard deviation of population
L is expected accuracy of sample

Production Conditions²

In the spring, fodder and grain reserves were adequate in most areas except the southeastern districts where there was short supply. Livestock pests were minimal, though damp conditions in the north contributed to scours in calves.

Pastures were generally in good condition, though in the spring growth was slow due to cool soil temperatures. Rain in June aided pastures, but in order to maintain growth in southern and eastern areas more rain was needed. Low pasture water reserves were reported in eastern areas, while those in western districts were good. Excess rain allowed pastures to grow quickly and hay was in ample supply. Cattle remained in good condition.

In general, good quality feed, straw and feed grain supplies were adequate to surplus across the province for the coming winter. However, deficits were reported in the east central areas north of the Red Deer River. Approximately 20 per cent of producers in these areas and northeastern districts expected possible shortfalls or deficit winter feed supplies.

Alberta, in general, had good feed and straw quality. Only four per cent of the total was rated as fair. Feed grains were of good to excellent quality. A summary of feed supplies as of November 30, 1990 is outlined below by region.

Southern Region

Feed, straw and feed grain supplies were adequate (over 50 per cent) to surplus (about 40 per cent) with possible shortfalls reported near Fort MacLeod.

2 As reported by Statistics Branch, Alberta Agriculture.

South Central Region

Feed, straw and feed grain supplies were adequate (over 50 per cent) to surplus (25 per cent) with possible shortfalls reported in the High River, Hanna and Wardlow areas. Deficits are reported in the Hanna and Oyen areas.

North Central Region

Winter feed supplies were generally adequate (45 per cent) to surplus (40 per cent) in the region. Deficits in feed, straw and feed grain supplies were reported in the Coronation, Rocky Mountain House, Kirriemuir and Veteran areas, with possible shortfalls in the Loughheed and Red Deer areas.

North East Region

Feed and straw supplies were adequate (71 per cent) with possible shortfalls from Lac La Biche southeast to Lloydminster. Feed grain supplies were adequate (46 per cent) to surplus (46 per cent) with some possible shortfalls in the same area.

North West Region

Feed and straw supplies were generally adequate. There were surplus supplies in some areas. Feed grain supplies were surplus (59 per cent) to adequate (38 per cent) with some possible shortfalls near Warburg, Leduc and Athabasca.

Peace River Region

Feed grain supplies were surplus (68 per cent) to adequate (32 per cent), while feed and straw supplies were generally adequate with surplus supplies in some areas. Possible shortfalls existed near Peace River, Grimshaw and Spirit River.

IV. ANALYSIS OF RESULTS

Income

The program of supply management of fluid milk in Alberta is administered by the Alberta Dairy Control Board. Fluid milk quotas held by the producers are assigned by the Board to the processing plants. The minimum fluid milk prices at farm, wholesale and retail levels are established by an independent Public Utilities Board (PUB). The PUB uses a fluid milk price formula³ to assist in establishing the monthly farm price. The producer price changed twice in 1990, in February and May. Wholesale and retail prices also changed in December, 1990. The chronology of the price changes is shown in Table 3.

TABLE 3 FLUID MILK PRICE CHANGES IN 1990

Effective Date	Producer Price \$/hL	Wholesale Price ¢/L	Retail Price ¢/L
December 31, 1989	52.05	86	93
February 2, 1990	53.03	87	94
May 2, 1990	54.01	88	95
December 1, 1990	54.01	89	96
December 31, 1990	54.01	89	96
Average	53.60	87.67	94.67

Fluid milk sales increased by one per cent over the previous year to 267.9 million litres from 265.3 million litres in 1989. The utilization of assigned fluid milk quota in 1990 was 75.83 per cent compared to 75.84 per cent in 1989.

3 The Alberta milk price formula was first adopted in November 1974; there was a major revision on July 1, 1980. A concise description of the formula is given in Appendix E.

Fluid milk producers shipping milk in excess of designated Class 1 (fluid) milk received a subsidy of \$1.675 per kilogram of butterfat (\$6.03 per hectolitre) if the milk was covered by national market share quota. The subsidy was paid in addition to industrial milk prices. In 1990 the subsidy was paid on 97 per cent of the excess and amounted to \$18,332,447.⁴ To pay for support program expenses, the Canadian Dairy Commission (CDC) held back a levy of \$2.90 per hL for in-quota production. In addition to this levy, the CDC continued to impose a skim-off levy on fluid milk deliveries. This levy was \$1.25 per hL on net skim-off, from January to July the levy was charged at 26 cents per hL sold and subsequently at 32 cents per hL sold, averaging 28 cents for the year.

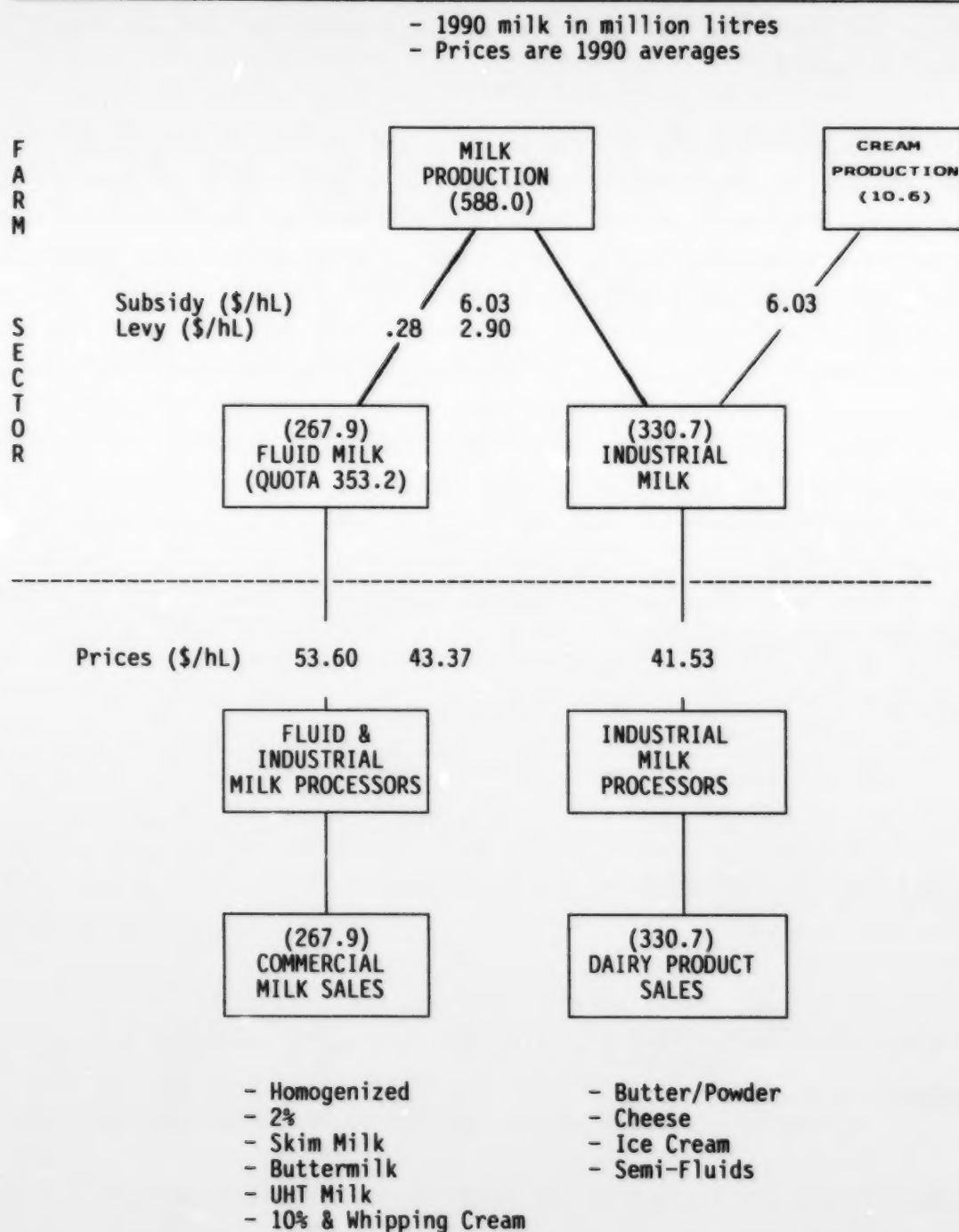
In 1990 levies were paid on 11,283,242 kilograms of butterfat in excess of designated Class 1 milk. Levies paid to C.D.C. for the 1990 calendar year were \$13,799,820 for fluid milk and \$56,016 for cream.

Over-quota levies are applied to production above the provincial quota and volume of milk under the Innovation Program Levies collected during the year are usually refunded depending on the provincial quota situation on July 31 (dairy year end). Over-quota deliveries for the dairy year ending July 1990 were at 3.75 per cent. For the 1990 calendar year the Alberta total deliveries exceeded the MSQ by 7 percent. Over-quota levy refunds for individual producers were made on deliveries up to 4.36 per cent over MSQ.

Figure 2 summarizes the quantities of milk and cream produced in Alberta, the utilization of these products and the prices received. Of the 588.0 million litres of milk shipped, 45.56 per cent was utilized as fluid milk, the other 54.44 per cent was utilized as industrial milk. Another 10.6 million litre (equivalent) was shipped as cream and utilized as industrial cream.

4 As provided by the Alberta Dairy Control Board.

FIGURE 2
MILK PRICES, QUANTITIES AND UTILIZATION



Production Costs

The three most significant inputs to dairy production are capital, labour and feed. The average prices of these inputs for 1989 and 1990 are shown in Table 4.

Investment value per cow decreased in the 1990 sample by 3.6 per cent over the previous year, while indebtedness also fell from 36 per cent to 32 per cent. Feed grain prices showed a significant decrease in 1990. The concentrate blend price fell by 8.6 per cent from the 1989 price. The \$10.00 feed grain market adjustment program was still in effect. Roughage prices increased by only 5.7 per cent in 1990 compared with the increase of 11.6 per cent in 1989. The proportion of roughage purchased increased from 13 per cent in the previous year to 24 per cent in 1990. The hourly rate paid for hired labour did not change significantly from \$9.12 per hour in the 1989 sample to \$9.11 in 1990. Family labour wages increased from \$8.02 to \$9.09 per hour. This change in part reflects the 1990 labour index but also a change in the method of valuing family labour over 18 years old. Previously the minimum wage was applied to this category of labour; from 1990 the operator wage rate is used.

TABLE 4: INPUT PRICES

	1989		1990	
	% Use	Average Price \$/cow	% Use	Average Price \$/cow
Land & Supplies Investment		376		504
Depreciable Investment		3665		3444
Livestock Investment		2083		1954
Total Investment	36*	6124	32*	5902
		\$/tonne		\$/tonne
Grain & Concentrate-homegrown	25	95.0	27	75.0
-purchased	75	195.0	73	185.0
Roughage-homegrown	87	72.0	76	75.9
-purchased	13	79.4	24	81.1
		\$/hr		\$/hr
Labour-hired	31	9.12	35	9.11
-family	69	8.02	65	9.09

*Debt/capital ratio or per cent indebtedness.

The above input prices, together with the input volume used on the farm made up the cost structure. The total production cost per hectolitre of milk increased only slightly by \$1.01 in 1990, from \$46.24 to \$47.25. Slight increases were experienced for dairy cash expenses, such as fuel, and repairs (\$0.73) and for labour (\$0.95). However, feed costs changed very little and capital costs showed decreases. The feed cost in 1990 accounted for 30.4 per cent of income, down slightly from 30.7 per cent a year ago. A comparison of income split in 1990 and 1991 is given in Figure 3.

The labour cost in 1990, at \$11.12 per hectolitre, accounted for 20.5 per cent of income, up from 18.9 per cent in 1989. Both wage rate and labour use increased slightly in 1990. Indebtedness fell from 36 per cent in the 1989 sample to 32 per cent in 1990. As a result capital costs fell slightly, making up 13.7 per cent of income as opposed to 14.6 per cent in 1989.

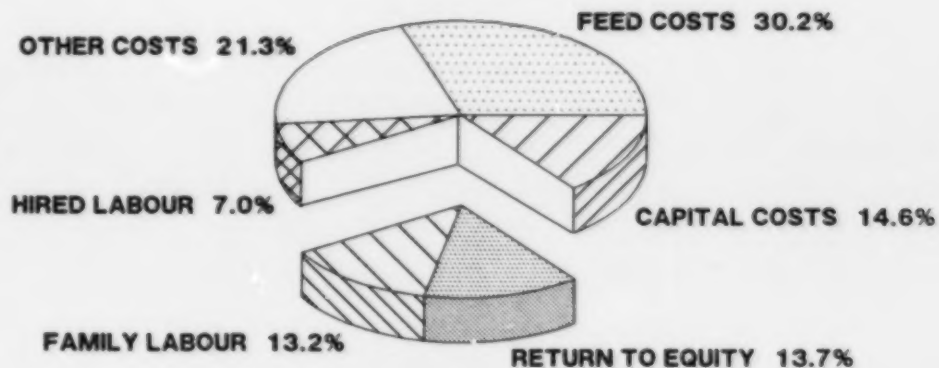
Table 5 portrays the cost of producing milk for the dairy enterprise in Alberta; for comparison Tables 6 and 7 display the results of Northern and Southern regions, respectively. Gross income is the sum of milk sales and value for inventory adjustment. During the 1990 production year, the price of fluid milk increased from \$52.05 to \$54.01 per hectolitre. This resulted in a higher blend price of all classes of milk in 1990. The fluid blend price of \$49.20 per hectolitre of milk sold was \$0.47 higher than the 1989 price. The fluid milk utilization of assigned fluid quota did not play a significant role in the milk price in 1990. There was no change in the subsidy received per hectolitre. The composite levy per hectolitre of all milk increased from \$1.47 to \$1.88. The miscellaneous receipts increased by \$0.04 to \$0.28 per hectolitre.

A combination of a 1.0 per cent increase in the blend price of milk and a 0.8 per cent increase in cow productivity produced small gains in income per cow of \$64.35. Income per cow increased by 1.8 per cent, while the income per hectolitre increased by 1.0 per cent.

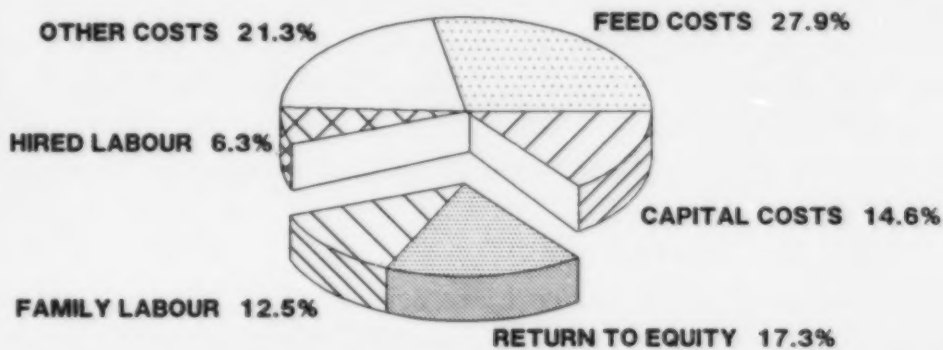
Inventory adjustment or the value for herd growth and credits did not change significantly, increasing by \$2.00 per cow in 1990 over 1989. The gross income per hectolitre of milk sold averaged \$54.19, up 1.0 per cent from \$53.68 in 1989.

FIGURE 3

**DAIRY ENTERPRISE COSTS
PERCENT OF INCOME**



ALBERTA-1990



ALBERTA-1989

**ALBERTA AGRICULTURE
PRODUCTION ECONOMICS BRANCH**

TABLE 5

ALBERTA AVERAGE
DAIRY ENTERPRISE COSTS AND RETURNS
(64 Producers)

	\$/HL SOLD 1989	PERCENT OF INCOME	\$/HL SOLD 1990	PERCENT OF INCOME
INCOME				
Milk Sales	47.71		48.59	
Milk Subsidy	2.49		2.49	
Milk Levies (-)	-1.47		-1.88	
Miscellaneous Receipts	0.24		0.28	
Net Cattle Sales (+/-)	3.72		3.92	
Net Inventory Increase (+/-)	1.00		0.78	
GROSS INCOME	53.68	100.00	54.19	100.00
EXPENSES				
Grain	2.28		2.45	
Complete Feed	5.25		4.82	
Supplement	1.50		1.22	
Minerals & Vitamins	0.45		0.40	
Roughage	6.91		7.48	
Processing Costs	0.10		0.09	
TOTAL FEED COSTS	16.49	30.71	16.46	30.38
Bedding and Supplies	1.64		1.67	
Breeding			0.39	
Vet. & Medicine	1.31		1.11	
Milk Hauling	1.69		1.64	
Producer's Fees	0.85		0.93	
Utilities	1.25		1.26	
Fuel, Oil, Lube	0.53		0.77	
Bldg. & Mach. Repairs	1.93		2.18	
Taxes & Insurance	0.79		0.72	
Miscellaneous	1.66		1.70	
TOTAL OTHER COSTS	11.64	21.68	12.37	22.83
Hired Labour	3.42		3.85	
Family Labour	6.74		7.27	
TOTAL LABOUR COSTS	10.17	18.94	11.12	20.51
TOTAL OPERATING COSTS	38.29		39.95	
Rent	0.34		0.43	
Depreciation	4.42		4.25	
Interest (Cap. Debt)	3.18		2.63	
TOTAL CAPITAL COSTS	7.94	14.80	7.31	13.48
TOTAL PRODUCTION COSTS	46.24	86.13	47.25	87.21
RETURN TO CAPITAL	15.39		14.24	
RETURN TO EQUITY*	7.44	13.87	6.93	12.79
MILK PRICE	48.72		49.20	
INVENTORY ADJUSTMENT	4.96		4.99	
INTEREST ON EQUITY (%)	12.81		11.72	
INTEREST ON DEBT (%)	9.58		9.34	

* Note: Return to Equity includes Management.

PRODUCTION ECONOMICS BRANCH, ALBERTA AGRICULTURE

TABLE 6

NORTHERN ALBERTA AVERAGE
DAIRY ENTERPRISE COSTS AND RETURNS
(42 Producers)

	\$/HL SOLD 1989	PERCENT OF INCOME	\$/HL SOLD 1990	PERCENT OF INCOME
INCOME				
Milk Sales	47.62		48.53	
Milk Subsidy	2.50		2.57	
Milk Levies (-)	-1.52		-1.91	
Miscellaneous Receipts	0.20		0.20	
Net Cattle Sales (+/-)	3.36		3.57	
Net Inventory Increase (+/-)	1.10		0.89	
GROSS INCOME	53.26	100.00	53.85	100.00
EXPENSES				
Grain	2.51		2.36	
Complete Feed	4.27		4.58	
Supplement	2.17		1.53	
Minerals & Vitamins	0.43		0.49	
Roughage	6.81		7.29	
Processing Costs	0.15		0.14	
TOTAL FEED COSTS	16.34	30.68	16.38	30.42
Bedding and Supplies	1.64		1.53	
Breeding			0.39	
Vet. & Medicine	1.32		1.16	
Milk Hauling	1.64		1.63	
Producer's Fees	0.94		0.97	
Utilities	1.23		1.11	
Fuel, Oil, Lube	0.55		0.76	
Bldg. & Mach. Repairs	1.78		1.96	
Taxes & Insurance	0.76		0.64	
Miscellaneous	1.28		1.31	
TOTAL OTHER COSTS	11.15	20.93	11.45	21.27
Hired Labour	3.03		2.87	
Family Labour	7.64		8.17	
TOTAL LABOUR COSTS	10.66	20.02	11.04	20.50
TOTAL OPERATING COSTS	38.15		38.87	
Rent	0.39		0.52	
Depreciation	4.46		4.21	
Interest (Cap. Debt)	3.64		3.15	
TOTAL CAPITAL COSTS	8.49	15.94	7.88	14.64
TOTAL PRODUCTION COSTS	46.64	87.57	46.76	86.83
RETURN TO CAPITAL	15.11		14.98	
RETURN TO EQUITY*	6.62	12.43	7.09	13.17
MILK PRICE	48.60		49.19	
INVENTORY ADJUSTMENT	4.66		4.66	
INTEREST ON EQUITY (%)	11.70		13.57	
INTEREST ON DEBT (%)	9.79		9.46	

* Note: Return to Equity includes Management.

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TABLE 7

SOUTHERN ALBERTA AVERAGE
DAIRY ENTERPRISE COSTS AND RETURNS
(22 Producers)

	\$/HL SOLD 1989	PERCENT OF INCOME	\$/HL SOLD 1990	PERCENT OF INCOME
INCOME				
Milk Sales	47.84		48.68	
Milk Subsidy	2.47		2.37	
Milk Levies (-)	-1.40		-1.84	
Miscellaneous Receipts	0.32		0.41	
Net Cattle Sales (+/-)	4.26		4.46	
Net Inventory Increase (+/-)	0.85		0.62	
GROSS INCOME	54.34	100.00	54.71	100.00
EXPENSES				
Grain	1.93		2.59	
Complete Feed	6.77		5.19	
Supplement	0.47		0.75	
Minerals & Vitamins	0.47		0.26	
Roughage	7.05		7.78	
Processing Costs	0.02		0.02	
TOTAL FEED COSTS	16.71	30.74	16.58	30.32
Bedding and Supplies	1.63		1.88	
Breeding			0.38	
Vet. & Medicine	1.30		1.04	
Milk Hauling	1.77		1.67	
Producer's Fees	0.70		0.87	
Utilities	1.27		1.49	
Fuel, Oil, Lube	0.50		0.77	
Bldg. & Mach. Repairs	2.16		2.54	
Taxes & Insurance	0.82		0.84	
Miscellaneous	2.25		2.32	
TOTAL OTHER COSTS	12.40	22.83	13.80	25.23
Hired Labour	4.03		5.38	
Family Labour	5.36		5.86	
TOTAL LABOUR COSTS	9.40	17.30	11.24	20.54
TOTAL OPERATING COSTS	38.15		41.62	
Rent	0.26		0.28	
Depreciation	4.36		4.33	
Interest (Cap. Debt)	2.48		1.80	
TOTAL CAPITAL COSTS	7.10	13.07	6.40	11.70
TOTAL PRODUCTION COSTS	45.61	83.94	48.02	87.79
RETURN TO CAPITAL	15.83		13.09	
RETURN TO EQUITY*	8.73	16.06	6.68	12.21
MILK PRICE	48.91		49.21	
INVENTORY ADJUSTMENT	5.43		5.50	
INTEREST ON EQUITY (%)	14.44		9.55	
INTEREST ON DEBT (%)	9.13		9.03	

* Note: Return to Equity includes Management.

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Returns

Although income increased in 1990 due to milk price increases, the cost of production has increased relatively more, causing a reduction in the per cent return to equity (See Table 8). The split of income between various categories of costs and return to equity for 1990 and 1989 is given in Figure 3. The percent of every dollar of income representing return to equity fell from 17.3 to 13.7. The nominal value of the return declined from \$7.44 per hectolitre to \$6.93. The average per cent return to equity fell from 12.8 to 11.7.

This rate of return varied widely within the sample of producers, being affected by the nominal dollar return and the debt equity ratio. The return to equity in dairy includes an allowance for management and risk, and what might be considered a reasonable rate of return would vary between well established producers and new entrants. Well established producers generally have lower debt and therefore carry less risk, as a consequence a relatively lower rate of return would be acceptable. New entrants with larger debt and thus higher risk require a higher return to equity, especially when the cost of quota is taken into account.

The analysis in this study does not include the value of the milk quota. This is a serious dilemma for new entrants. When actual payment for milk quota has been made, the average rate of return is diluted to 6.5 per cent.

TABLE 8 RETURN TO EQUITY

	1990 Study Average	Including Quota Value*
1. Dairy Investment (\$)	388,631	576,516
2. Debt (\$)	125,154	185,277
3. Equity (\$)	263,477	391,239
4. Equity (\$/hL sold)	59.17	87.87
5. Blend Price	49.20	49.20
6. Other Credits	4.98	4.98
7. Production Costs	47.25	48.51
8. Paid Interest	2.63	3.89
9. Return to Equity (\$/hL)	6.93	5.67
10. % Return (9/4)	11.72	6.45

* Applicable to new entrants.

Table 9 illustrates the acceptable total debt load per cow at various levels of milk production and interest rates. The basic repayment capacity is given by gross return, i.e. money available for resource ownership payment, consisting of rent, depreciation, paid and equity interest. The (1988-90) three year average was \$1,024 per cow based on an average production of 6915 hL per cow. This table should be used as a guideline only, each individual situation is different.

The repayment capacity varies with productivity. The results in Table 9 are for three year average productivity, costs and returns. Payment capacity ranged from \$156 to \$1,054 per cow with milk production ranging from 4,500 to 7,000 hL per cow. It was assumed that feed costs would vary in proportion to productivity but other costs would remain constant within the range of productivity examined.

The gross returns achievable would support loans at the low productivity (4,500 hL), high interest rate (15%) situation of \$972 per cow or only 16 per cent debt. As productivity increases and interest rates fall, the debt servicing capacity increases to \$8,969 per cow.

TABLE 9 ACCEPTABLE TOTAL DEBT LOAD PER COW

Milk Production (hL/Cow)	Interest Rate*					
	10 %	11 %	12 %	13 %	14 %	15 %
4,500	1322	1237	1160	1091	1029	972
5,500	4381	4098	3843	3615	3408	3221
6,000	5910	5528	5185	4876	4598	4345
6,500	7439	6958	6527	6138	5787	5469
7,000	8969	8389	7869	7400	6977	6594

* At 20 Years Repayment Period.

At the current rate of investment per cow (\$5,900), 100 per cent ownership costs are covered at an average production of 6,000 hL per cow and a 10 per cent interest rate. For higher rates of interest, higher productivity is required. When quota is taken into account (investment of

\$8,750 per cow), 100 per cent of ownership costs are only covered at 7,000 hL per cow and a 10 per cent interest rate.

Price Formula Comparison With Cost Study Results

For comparison purposes, some basic economic indicators are given in Table 10 for the base year of the price formula, 1973, and for 1990. Dairy investment has more than tripled from \$90,513 to \$388,631 per farm, while investment per cow increased about two and a half times from \$1,618 to \$5,795. This relative difference reflects an increase in average herd size from 57 to 66 cows over the period.

No information was collected on debt in 1973. However, for comparison to be on the same basis, it was assumed that debt levels were similar to those in the 1980's at 32 per cent. Production costs excluding interest on capital debt, increased from \$17.39 to \$44.62 per hectolitre over the period, a 156.6 per cent increase. With interest included the increase was 156.2 per cent.

Over the same period, the Class 1 price of milk increased from \$21.04 to \$53.60 per hectolitre, a 154.8 per cent increase, lagging only slightly behind production costs. The formula index itself increased by 154.2 per cent. The value of other dairy credits increased at a much lower rate of 64.9 per cent resulting in a gross income increase of 142.1 per cent.

Since gross income increased at a slower rate than did costs, the increase in return to equity was also slower, moving from \$3.94 per hectolitre (assuming interest on 32 per cent debt) to \$6.93 per hectolitre, a 76.0 per cent increase.

TABLE 10

COMPARISON OF 1990 DAIRY COST STUDY
RESULTS WITH THE MILK PRICE FORMULA

	1973 Base		1990 Study	% Change
Debt/Equity Ratio	100%	32%*	32%	*
Investment/Cow (\$)	1618		5795	258.2
Dairy Investment (\$)	90,513		388,631	329.4
Debt (\$)		28,964	125,154	332.1
Equity (\$)	90,153	61,549	263,477	328.1
Equity (\$/hL)	33.58	22.35	59.17	164.8
Blend Price	19.36		49.20	154.1
Other Credits	3.02		4.98	64.9
Gross Income	22.38		54.18	142.1
Production Costs (excl.int.)	17.39		44.62	156.6
Paid Interest		1.05	2.63	150.1
Production Costs (incl.int.)		18.44	47.25	156.2
Return to Equity	4.99	3.94	6.93	76.0
% Return to Equity	14.86	17.62	11.72	-
Class 1 Price	21.04		53.60	154.8
Price Formula Indices	100.00		254.21	154.2
Price Formula Supply Indices	100.00		264.15	164.2

* Debt imputed at 32% and interest at 10% for 1973.

Again, assuming 32 per cent debt in 1973, the percentage return to equity was 18 per cent (15 per cent if no debt is assumed). In 1990, this return was 12 per cent, falling by 6 points from 1973.

This decrease is in part due to gross income lagging costs and in part to the relatively larger increase in equity when compared with income. Equity per hectolitre increased by 164.8 per cent as compared with return to equity which increased by only 76.0 per cent. At 1973 equity levels, 1990's returns to equity would be at about 20 per cent.

Other considerations to be taken into account are changes in technology and changes in short term government assistance. Between 1973 and 1990 production per cow increased from 4,923 litres to 6,945 litres. At the same time, feed conversion improved from 1.74 litres to 1.86 litres per kilogram of feed. This gain in productivity is responsible for some restraint on cost increases and thus also contributed to restraining price increases through the formula. At 1973 feed conversion levels, returns to equity would be one to two percentage points below 1990 levels.

In 1973 the Federal Government was paying a subsidy on industrial milk which varied from \$3.29 to \$5.81 per hectolitre. In 1990 the direct support payment for industrial milk was \$6.03 per hectolitre. This rate has been constant since 1975.

Management Profile

Dairy management is concerned with the organizing, planning, directing and supervising of a dairy business. Dairy farmers carry out these functions. In addition, many farmers provide their own labour.

Table 11 provides a cross-section of values of management factors. For each factor, estimates for the top 1/3 group are given on the first line and the estimates for the bottom 1/3 group are on the second line. For instance, the top 1/3 group in milk production (8149L) spent \$1,287.80 per cow on feed, while the bottom 1/3 group spent only \$890.90 per cow. Labour use for the two groups was 85 hours per cow and 70 hours, respectively, and cost of producing a hectolitre was \$44.98 and \$47.78, respectively.

The overall level of management was determined by five factors:

1. Milk production per cow
2. Total cost per hectolitre of milk
3. Milk production per hour of work
4. Feed conversion
5. Milk production per dollar of investment

TABLE 11

PROFILE OF MANAGEMENT FACTORS
FOR MILK PRODUCTION(1)

TOP 1/3 BOTTOM 1/3 AVERAGES FOR:	GROSS INCOME \$/HL	MILK PRODUCTION L/COW	TOTAL COST \$/HL	YEARS IN DAIRY	HERD SIZE	INVEST. PER COW	DEBT/ CAPITAL RATIO	EQUITY RETURN %	FEED COST \$/COW	LABOUR HR/COW	OVERALL MGMT RATING
GROSS INCOME \$/HL	57.30 50.33	6846 7137	50.43 45.27	19.1 12.1	77.7 60.2	5844 5519	0.32 0.43	16.87 39.76	1097.1 1108.5	91 78	1.8 2.3
MILK PRODUCTION L/COW	53.82 53.71	8149 5632	44.98 47.78	14.3 18.0	65.8 62.8	6035 4884	0.39 0.28	33.70 11.04	1287.8 890.9	85 70	2.0 2.0
TOTAL COST \$/HL	52.89 54.84	7201 6843	38.89 55.81	16.9 18.7	69.4 72.8	5070 6493	0.32 0.29	46.44 0.01	990.4 1206.6	69 94	2.1 1.8
YEARS IN DAIRY	54.38 53.44	6644 7456	48.22 46.65	29.1 6.2	78.1 55.3	5651 5326	0.21 0.32	11.74 46.57	1033.2 1183.9	82 91	2.0 1.8
HERD SIZE	54.75 53.09	6874 7063	48.29 47.39	20.6 13.0	100.4 40.2	5900 5819	0.36 0.38	16.44 34.54	1081.9 1103.7	78 89	2.1 2.0
INVESTMENT PER COW	53.76 53.23	7426 6329	49.39 45.47	20.7 16.9	79.9 64.3	7565 3988	0.27 0.34	7.23 38.04	1200.0 1014.6	84 73	2.1 2.0
DEBT/CAPITAL RATIO	54.85 53.63	6470 7351	48.00 47.03	24.8 9.4	68.3 62.5	5450 5319	0.06 0.66	10.21 50.37	1010.8 1136.9	83 83	1.8 2.1
EQUITY RETURN %	53.61 54.04	7348 6520	42.38 55.53	11.3 19.9	64.1 75.7	4629 6456	0.53 0.28	59.13 -1.95	1102.8 1166.8	77 88	2.0 1.9
FEED COST \$/COW	53.77 54.26	5942 7771	42.20 49.49	16.9 13.5	55.1 68.1	5107 6533	0.32 0.37	26.79 12.89	810.9 1378.5	74 88	1.9 2.0
LABOUR HR/COW	52.78 54.76	6707 7146	43.24 51.98	15.0 18.2	75.8 66.0	5372 6126	0.31 0.38	24.84 31.42	1070.2 1167.1	57 108	2.3 1.9
OVERALL MGMT RATING	52.51 55.21	7166 6960	44.11 47.94	14.1 14.7	69.8 65.0	5976 5114	0.41 0.33	27.28 17.11	1117.2 1088.3	77 86	3.0 1.0
WEIGHTED AVERAGE	54.19	6998	47.25	15.8	65.9	5795	0.32	11.72	1113.1	83	2.0

(1) Each line contains values for the top 1/3 and bottom 1/3 group set by the left hand side factor.

Overall management is an average based on ratings of 1 to 3 for five key factors.

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Each of these factors was rated 1 to 3 for the bottom, middle and top 1/3 producers respectively. Each producer was then given an average rating for the five factors. From these averages, the top 1/3 producers in all five factors were rated 3 and bottom 1/3 were rated 1. The last column in Table 11 indicates a blend of 1 to 3 for each factor, depending on whether that group had more top managers (closer to 3) or not.

Several conclusions can be derived from Table 11. Producers with the highest gross incomes also had the highest costs per hL and had a net return of \$6.87 per hL compared with \$5.06 for the bottom 1/3 producers. Their per cent return to equity was lower than the group with the lowest gross incomes. Producers who are relatively new in dairy (6.2 years) have debt/capital ratios of 0.52, while for established producers (29.1 years) indebtedness was reduced to 21%. The new producers had returns to equity averaging 46.6 per cent. This is in keeping with the requirement of a higher return because of the higher risk levels associated with higher debt. The established producers showed an average return of 11.7 per cent, quite reasonable for low debt levels.

As shown in Table 11, higher average management ratings tended to be more strongly associated with low labour input than with other factors. The top 1/3 management group had larger herds, higher investment per cow and higher milk production per cow. This group however, received a lower price per hL (gross income per hL) because of penalties associated with producing over quota milk. They also had lower total costs per hL and higher per cent returns to equity. The cost of milk production for the top 1/3 management group was 6.6 per cent better than the provincial average and 8.0 per cent better than the bottom 1/3 management group.

Regional Comparisons

Return to equity for northern producers increased in 1990, while the average for southern producers fell, reversing the relative values achieved in 1989. Northern producers experienced a larger increase in income as well as a smaller increase in costs per hL than did southern producers. The major difference was for hired labour which increased by one-third (\$1.35 per hL) for southern Alberta but fell slightly (16 cents per hL) for northern

Alberta. The per cent share of income between return to equity and various cost categories are provided for northern and southern producers in Figure 4. The main difference is the split between hired and family labour.

On average, management levels were similar for northern and southern producers, both groups had average ratings of 2. However, southern producers had a relatively larger proportion in the middle 1/3 group (41 per cent) with a rating of 2, while northern producers had larger proportions in the top 1/3 and bottom 1/3 groups (36 per cent in each) with ratings of 3 and 1 respectively. Southern producers had slightly better feed conversion and milk to labour ratios, and higher levels of production per cow than northern producers. However, they also had higher investment per cow, a slightly lower milk production level per dollar of investment and higher feed costs per cow. The result was a slightly lower dollar per hL return to equity, \$6.68 for southern producers compared with \$7.09 for northern producers. Because of a lower debt to equity ratio (22% for southern Alberta and 39% for northern Alberta), the difference in percent return to equity was greater than the difference in dollar return to equity between the two groups. Results for the two groups are summarized in Table 12.

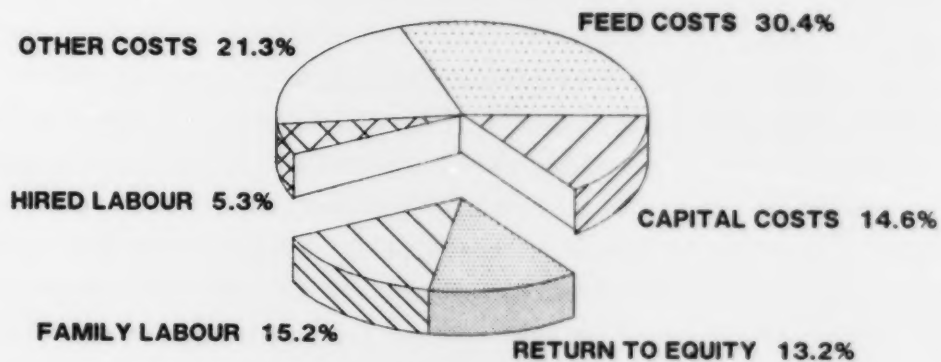
Trends Over The Last Decade, 1980-1990

From 1980 to 1990 there have been a number of changes in the industry reflected through the sample of dairy producers. Average herd size increased from 57 to 66 cows and production per cow from 5,705 litres to 6,998 litres.

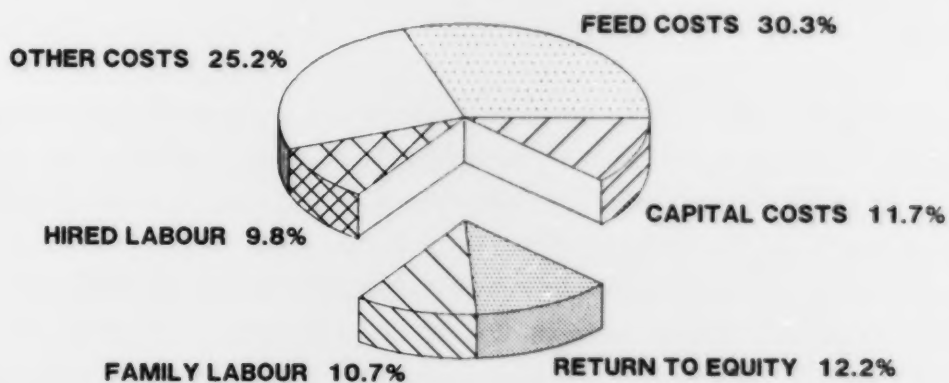
Investment per cow also increased from \$3,858 to \$5,795 and the debt/equity ratio fluctuated between 26 and 36 per cent (averaging 32 per cent). Equity per hectolitre of milk produced increased from \$45.31 to \$57.17. The interest on debt capital fluctuated between 8.5 and 13 per cent and on equity capital between 10 and 16.5 per cent. These returns averaged close to 10 and 13 per cent respectively. In 1990 the debt/equity ratio was at the average and both the interest on debt and on equity were about one percentage point below the averages.

FIGURE 4

**DAIRY ENTERPRISE COSTS-1990
PERCENT OF INCOME**



NORTHERN ALBERTA



SOUTHERN ALBERTA

**ALBERTA AGRICULTURE
PRODUCTION ECONOMICS BRANCH**

TABLE 12

REGIONAL COMPARISONS

	Northern Alberta	Southern Alberta
Herd Size	61.8	73.6
Milk Production (L/Cow)	6909	7141
Feed Conversion (L/Kg.)	1.79	1.85
Milk to Labour (L/Hr)	83.33	86.97
Investment per Cow (\$/Cow)	5621	6073
Milk Production per \$ invest (L/\$)	1.21	1.16
Feed Cost per Cow (\$/Cow)	1096.4	1139.9
Total Cost (\$/hL)	46.76	48.02
Return to Equity (\$/hL)	7.09	6.68
Percent Return to Equity (%)	13.57	9.55
Debt to Equity Ratio (%)	0.39	0.22
Overall Management Rating	2.0	2.0

Gross income per hectolitre increased from \$39.99 in 1980 to \$54.19 in 1990, an increase of 35.5 per cent. This is illustrated graphically in Figure 5. Production costs increased at a slightly faster rate than income, from \$34.65 to \$47.25 per hectolitre or by 36.4 per cent. Feed costs which make up 37.4 per cent of total costs increased by only 17.1 per cent from \$14.06 to \$16.46 per hectolitre. Interest paid on capital debt fell by 12.0 per cent from \$2.99 to \$2.63 per hectolitre. All other costs increased by 45 per cent or more. Labour cost increases were responsible for 35 per cent of the total cost increase over the period. Other operating costs accounted for 31 per cent of the increase, feed 19 per cent and capital costs 15 per cent.

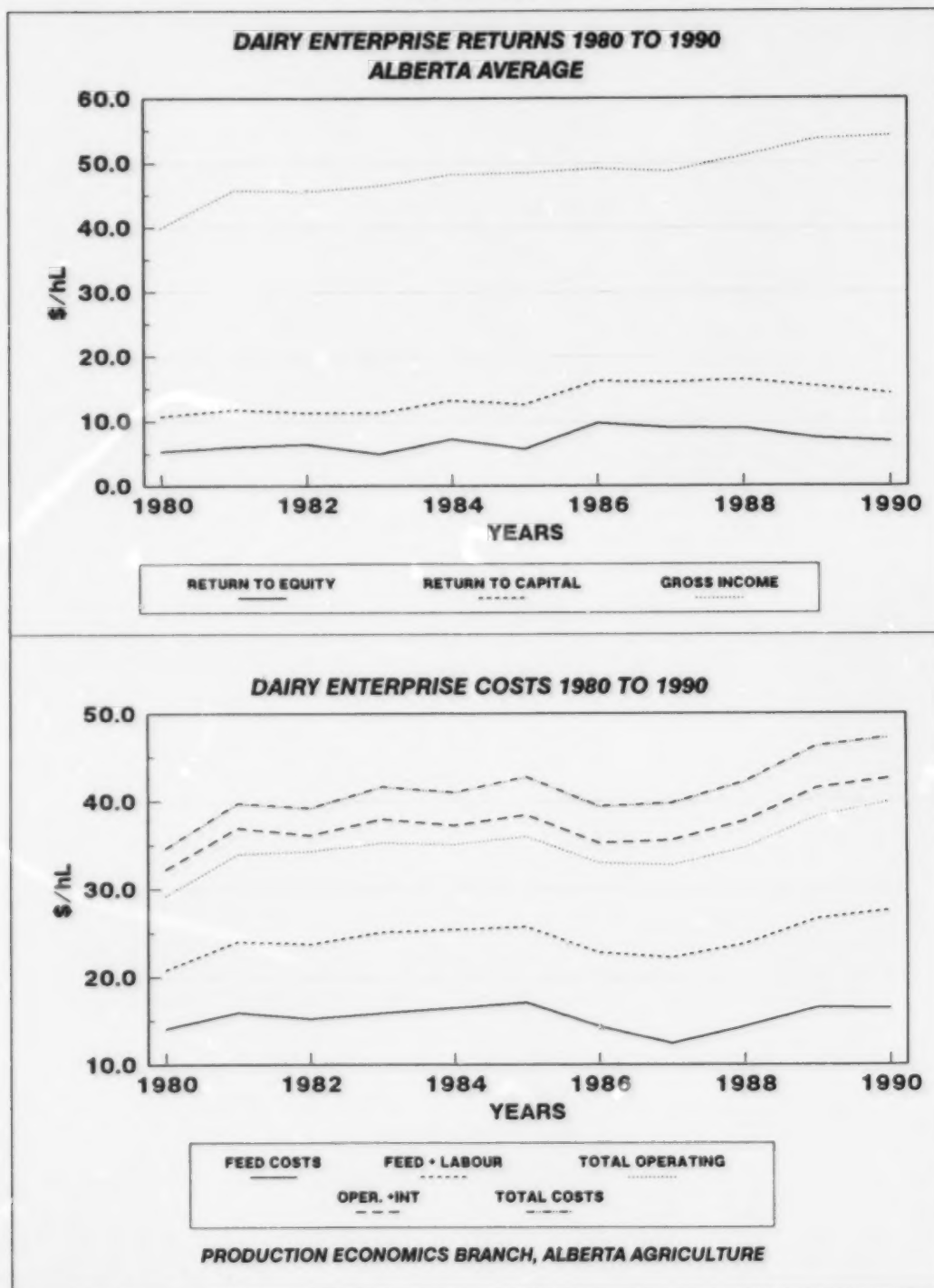
Return to capital increased by \$3.51 per hectolitre or 32.7 per cent. The percentage return on capital increased by 1.3 points from 15.9 to 17.2. Return on equity increased at a lower rate of \$1.59 per hectolitre or by 29.8 per cent. The percentage return to equity increased by 0.6 point from 11.1 to 11.7.

An examination of some management factors also highlights some trends over the period. While milk production per cow showed a general upward trend, some other management factors fluctuated quite a bit. Milk production per kilogram of feed varied between 1.81 and 2.22 litres, with 1990 being at the minimum level. Feed per cow also fluctuated from 2.53 to 3.86 kilogram, with 1990 being at the maximum level. These two factors indicate some slipping in feeding efficiency.

In 1980 home grown feed made up 50 per cent of concentrate fed and 77 per cent of roughage fed. The per cent concentrate from home grown feed fell steadily to a low of 24.5 per cent in 1990. This trend is in part due to the continuous down trend of grain prices, making purchased feed relatively more profitable than in the past. The per cent home grown roughage varied between 66 and 87 per cent, (averaging 78 per cent), with 1990 being just below the average at 76 per cent.

The calf-crop fluctuated but showed an upward trend, the 1990 value being 87.7 per cent or 7 percentage points above the average for the period. Hours of labour per cow increased by 5.7 hours to a maximum of 82.6 hours per cow in 1990. However, unlike feed conversion, the milk to labour ratio improved moving from 72.5 litres in 1980 to 84.7 litres in 1990, with the average for the period being 78.1 litres. Finally, milk production per dollar of capital investment fell over the period from 1.3 litres in 1980 to 1.19 litres in 1990 reflecting the increase in capital investment per cow. The average for the period was 1.29 litres per dollar of investment.

FIGURE 5



APPENDIX A

ALBERTA

AVERAGE FARM SUMMARIES

ALBERTA AVERAGE

(64 Producers)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1990

	TOTAL ENTERPRISE	PER COM	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	216361.32	3285.79	48.59	
MILK SUBSIDY	11093.53	168.47	2.49	
MILK LEVIES (-)	-8387.06	-127.37	-1.88	
MISCELLANEOUS RECEIPTS	1264.59	19.20	.28	
NET CATTLE SALES (+)	17440.67	264.86	3.92	
NET INVENTORY INCREASE (+)	3494.97	53.08	.78	
GROSS INCOME -----	241268.02	3664.03	54.19	100.00
EXPENSES:				
GRAIN	10898.74	165.51	2.45	
COMPLETE FEED	21456.90	325.86	4.82	
SUPPLEMENT	5452.53	82.81	1.22	
MINERALS & VITAMINS	1763.01	26.77	.40	
ROUGHAGE	33306.15	505.81	7.48	
PROCESSING COSTS	416.98	6.33	.09	
TOTAL FEED COSTS -----	73294.31	1113.09	16.46	30.38
BEDDING AND SUPPLIES	7432.51	112.87	1.67	
BREEDING	1723.13	26.17	.39	
VET. AND MEDICINE	4952.25	75.21	1.11	
MILK HAULING	7310.92	111.03	1.64	
PRODUCER'S FEES	4153.56	63.08	.93	
UTILITIES	5597.21	85.00	1.26	
FUEL, OIL, LUBE	3414.38	51.85	.77	
BLDG. & MACH. REPAIRS	9718.42	147.59	2.18	
TAXES AND INSURANCE	3204.37	48.66	.72	
MISCELLANEOUS	7574.39	115.03	1.70	
TOTAL OTHER COSTS -----	55081.14	836.49	12.37	22.83
HIRED LABOR	17142.03	260.33	3.85	
FAMILY LABOR	32349.88	491.28	7.27	
TOTAL LABOR COSTS -----	49491.91	751.61	11.12	20.51
TOTAL OPERATING COSTS ====	177867.35	2701.19	39.95	
RENT	1898.18	28.83	.43	
DEPRECIATION	18944.03	287.69	4.25	
INTEREST (CAP.DEBT)	11690.82	177.54	2.63	
TOTAL CAPITAL COSTS -----	32533.02	494.07	7.31	13.48
TOTAL PRODUCTION COST ====	210400.38	3195.26	47.25	87.21
RETURN TO CAPITAL	63400.67	962.84	14.24	
RETURN TO EQUITY *	30867.65	468.77	6.93	12.79
MILK PRICE			49.20	
INVENTORY ADJUSTMENT			4.99	
INTEREST ON EQUITY (%)			11.72	
INTEREST ON DEBT (%)			9.34	

* Note: Return to Equity Includes Management.

TABLE 2

**** STATEMENT OF INVESTMENT ****
1990

LAND BUILDINGS & EQUIPMENT		AGE	DEPRECIATION		DAIRY INVESTMENT
DAIRY BUILDINGS		10.30	6757.89		159433.57
POWER MACHINERY		5.50	4950.77		33427.40
DAIRY EQUIPMENT		7.48	5700.68		26328.22
OTHER EQUIPMENT		5.82	1534.68		7591.81
TOTAL EQUIPMENT		6.15	12186.13		67347.43
LAND					28717.97
SUPPLIES					4491.38
** SUBTOTAL **			18944.03		259990.34
<u>DAIRY LIVESTOCK</u>					
		---BEGIN YEAR---	--END OF YEAR---		AVERAGE
		NUMBER	VALUE		VALUE
COWS	65.94	92955.39	67.06	94541.36	93748.38
BRED HEIFERS	16.94	16077.39	17.19	16314.70	16196.04
OPEN HEIFERS	23.36	11752.69	27.19	13678.71	12715.70
HEIFER CALVES	21.38	4325.10	18.84	3812.92	4069.01
BULL CALVES	10.47	1320.86	10.17	1283.40	1302.13
BULLS	.39	461.43	.64	756.74	609.08
** SUBTOTAL **		138.47	126892.85	141.09 130387.83	128640.34
TOTAL DAIRY INVESTMENT		----- 388630.68			
CAPITAL LOANS		125153.76			
OPERATOR EQUITY		263476.92			
INVESTMENT PER COW		5795.05			
DEBT/CAPITAL RATIO		.32			
CAPITAL TURNOVER (YR)		1.61			
-----HERD SIZE-----					
NUMBER OF DAIRY COWS	65.85				
NUMBER OF ANIMAL UNITS	105.74				
DRY COWS (%)	16.25				
CALF CROP (%)	87.73				
PASTURE PER COW (AC.)	.89				
-----CATTLE SALES & PURCHASES-----					
		NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS	16.22	740.86	.73	1668.02	
BRED HEIFERS	1.17	1043.01	.70	1144.44	
OPEN HEIFERS	1.41	642.96	.19	987.50	
HEIFER CALVES	1.36	264.63	.08	1860.00	
BULL CALVES	26.33	190.69	.13	125.00	
BULLS	.50	912.73	.16	1040.00	
TOTAL VALUE		19978.90		2538.23	

TABLE 3

***** LABOUR AND MANAGEMENT *****

<u>LABOUR</u>	HOURS	VALUE	HOURLY RATE	
OPERATOR LABOUR	2379.11	22006.76	9.25	
HIRED LABOUR	1881.06	17142.03	9.11	
FAMILY UNPAID LABOUR	1179.19	10343.12	8.77	
TOTAL	5439.36	49491.91	9.10	
RETURN TO FAMILY LABOUR	9.62	\$/HR		
MAN EQUIVALENTS	2.18			
LABOUR HOURS PER COW	82.61			
YEARS FARMING	15.83			
<u>MILK PRODUCTION</u>				
	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	3173.72	68.87	162449.06	51.19
OVER QUOTA MILK	1259.49	27.33	52784.27	41.91
OTHER MILK SALES	19.41	.42	949.41	48.91
FED TO LIVESTOCK	155.51	3.37	7550.07	48.55
TOTAL	4608.12	100.00	223732.82	48.55
FLUID QUOTA	850.39	LITRES/DAY		
QUOTA PRICE	220.94	\$/LITRE		
CLASS 1 UTILIZATION	75.83	%		
BUTTERFAT TEST	3.68	KG/HL		
MILK PRODCUTION PER COW	6998.15	LITRES		
<u>MANAGEMENT FACTORS</u>				
COST PER HL	47.25			
MILK/FEED (KG) RATIO	1.81	LITRES		
MILK/LABOUR (HR) RATIO	84.72	LITRES		
MILK/CAPITAL (\$) RATIO	1.19	LITRES		

TABLE 4

***** FEED REPORT *****
1990

<u>CONCENTRATES</u>	----PURCHASED-----		----HOMEGROWN----	
	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	3.05	73.73	9.28	72.85
BARLEY	37.21	89.22	40.15	77.60
WHEAT	6.48	132.69	.01	106.00
MIXED GRAIN	5.59	103.37	17.91	69.15
BREW GRAIN (DRY EQ.)	4.72	172.67		
BEET PULP	.39	179.25		
DAIRY RATION	104.89	187.71		
CALF FEED	4.60	300.38		
MILK REPLACER	.24	1642.26		
SUPPLEMENT	16.27	330.08		
MOLASSES	.27	304.71		
SALT	.88	245.79		
MINERALS & VITAMINS	2.13	726.27		
SUBTOTAL -----	186.71	34539.52	67.36	5031.67
<u>ROUGHAGE</u>				
ALFALFA HAY	79.06	82.18	178.21	79.38
ALFALFA PELLETS	2.09	146.90		
STRAW FED	.12	23.37	1.89	31.70
GREENFEED	2.54	48.33	16.28	56.70
SILAGE (DRY EQ.)	18.22	73.60	133.27	74.33
SUBTOTAL -----	102.03	8271.10	329.65	25035.05
GRINDING		416.98		
GRAND TOTAL FEED COSTS		43227.60		30066.71
BEDDING STRAW	34.87	31.59	36.39	31.97
AV. PRICE: CONCENTRATE	155.75	\$/TONNE		
ROUGHAGE	77.15	\$/TONNE		
FED PER COW: CONCENTRATE	3.86	TONNES		
ROUGHAGE	6.56	TONNES		
% HOME GROWN: CONCENTRATE	26.51	%		
ROUGHAGE	76.36	%		

APPENDIX B

NORTHERN ALBERTA

AVERAGE FARM SUMMARIES

NORTHERN ALBERTA AVERAGE

(42 Producers)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1990

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	200767.35	3248.06	48.53	
MILK SUBSIDY	10628.36	171.95	2.57	
MILK LEVIES (-)	-7896.26	-127.75	-1.91	
MISCELLANEOUS RECEIPTS	831.71	13.46	.20	
NET CATTLE SALES (+)	14754.79	238.71	3.57	
NET INVENTORY INCREASE (+)	3685.34	59.62	.89	
GROSS INCOME -----	222771.30	3604.04	53.85	100.00
EXPENSES:				
GRAIN	9761.87	157.93	2.36	
COMPLETE FEED	18946.78	306.53	4.58	
SUPPLEMENT	6319.67	102.24	1.53	
MINERALS & VITAMINS	2006.66	32.46	.49	
ROUGHAGE	30138.62	487.59	7.29	
PROCESSING COSTS	593.82	9.61	.14	
TOTAL FEED COSTS -----	67767.42	1096.36	16.38	30.42
BEDDING AND SUPPLIES	6343.58	102.63	1.53	
BREEDING	1617.64	26.17	.39	
VET. AND MEDICINE	4783.55	77.39	1.16	
MILK HAULING	6726.93	108.83	1.63	
PRODUCER'S FEES	4024.57	65.11	.97	
UTILITIES	4580.44	74.10	1.11	
FUEL, OIL, LUBE	3163.90	51.19	.76	
BLDG. & MACH. REPAIRS	8088.80	130.86	1.96	
TAXES AND INSURANCE	2648.91	42.85	.64	
MISCELLANEOUS	5407.09	87.48	1.31	
TOTAL OTHER COSTS -----	47385.42	766.61	11.45	21.27
HIRED LABOR	11873.29	192.09	2.87	
FAMILY LABOR	33788.41	546.64	8.17	
TOTAL LABOR COSTS -----	45661.71	738.72	11.04	20.50
TOTAL OPERATING COSTS =====	160814.55	2601.69	38.87	
RENT	2160.52	34.95	.52	
DEPRECIATION	17409.08	281.65	4.21	
INTEREST (CAP.DEBT)	13048.52	211.10	3.15	
TOTAL CAPITAL COSTS -----	32618.12	527.70	7.88	14.64
TOTAL PRODUCTION COST =====	193432.67	3129.40	46.76	86.83
RETURN TO CAPITAL	61956.75	1002.35	14.98	
RETURN TO EQUITY *	29338.62	474.65	7.09	13.17
MILK PRICE			49.19	
INVENTORY ADJUSTMENT			4.66	
INTEREST ON EQUITY (%)			13.57	
INTEREST ON DEBT (%)			9.46	

* Note: Return to Equity Includes Management.

TABLE 2

**** STATEMENT OF INVESTMENT ****
1990

<u>LAND BUILDINGS & EQUIPMENT</u>		AGE	DEPRECIATION		DAIRY INVESTMENT
DAIRY BUILDINGS		9.04	6335.41		148606.56
POWER MACHINERY		5.24	4339.98		29414.03
DAIRY EQUIPMENT		7.06	5322.64		25019.88
OTHER EQUIPMENT		6.47	1411.05		6798.11
TOTAL EQUIPMENT		5.94	11073.67		61232.02
LAND					18627.14
SUPPLIES					4444.55
** SUBTOTAL **			17409.08		232910.28
<u>DAIRY LIVESTOCK</u>		---BEGIN YEAR---		--END OF YEAR---	
		NUMBER	VALUE	NUMBER	VALUE
COWS		61.95	87239.28	63.00	88714.50
BRED HEIFERS		16.38	15561.90	16.31	15494.05
OPEN HEIFERS		21.33	10666.67	26.81	13404.76
HEIFER CALVES		20.79	4157.14	16.52	3304.76
BULL CALVES		9.74	1217.26	9.90	1238.10
BULLS		.43	514.29	.74	885.71
** SUBTOTAL **		130.62	119356.54	133.29	123041.88
TOTAL DAIRY INVESTMENT		-----			354109.49
CAPITAL LOANS					137915.56
OPERATOR EQUITY					216193.93
INVESTMENT PER COW					5620.79
DEBT/CAPITAL RATIO					.39
CAPITAL TURNOVER (YR)					1.59
-----HERD SIZE-----					
NUMBER OF DAIRY COWS		61.81			
NUMBER OF ANIMAL UNITS		100.11			
DRY COWS (%)		16.04			
CALF CROP (%)		88.25			
PASTURE PER COW (AC.)		.68			
-----CATTLE SALES & PURCHASES-----					
		NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE
COWS		14.93	681.93	.86	1822.14
BRED HEIFERS		.81	971.63	.57	1043.75
OPEN HEIFERS		1.71	621.02	.21	450.00
HEIFER CALVES		1.67	252.20	.05	150.00
BULL CALVES		24.10	190.95	0.00	0.00
BULLS		.26	807.55	.24	1040.00
TOTAL VALUE			17264.24		2509.45

TABLE 3

***** LABOUR AND MANAGEMENT *****

<u>LABOUR</u>	HOURS	VALUE	HOURLY RATE	
OPERATOR LABOUR	2437.67	22548.42	9.25	
HIRED LABOUR	1402.67	11873.29	8.46	
FAMILY UNPAID LABOUR	1284.55	11240.00	8.75	
TOTAL	5124.88	45661.71	8.91	
RETURN TO FAMILY LABOUR	10.57	\$/HR		
MAN EQUIVALENTS	2.05			
LABOUR HOURS PER COW	82.91			
YEARS FARMING	12.60			
<u>MILK PRODUCTION</u>				
	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	2880.62	67.45	147863.24	51.33
OVER QUOTA MILK	1238.75	29.01	52000.95	41.98
OTHER MILK SALES	17.39	.41	845.54	48.62
FED TO LIVESTOCK	133.69	3.13	6486.52	48.52
TOTAL	4270.45	100.00	207196.25	48.52
FLUID QUOTA	763.45	LITRES/DAY		
QUOTA PRICE	213.43	\$/LITRE		
CLASS 1 UTILIZATION	75.83	%		
BUTTERFAT TEST	3.69	KG/HL		
MILK PRODCUTION PER COW	6908.83	LITRES		
<u>MANAGEMENT FACTORS</u>				
COST PER HL	46.76			
MILK/FEED (KG) RATIO	1.79	LITRES		
MILK/LABOUR (HR) RATIO	83.33	LITRES		
MILK/CAPITAL (\$) RATIO	1.21	LITRES		

TABLE 4

***** FEED REPORT *****
1990

<u>CONCENTRATES</u>	----PURCHASED----		----HOMEGROWN----	
	QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS	4.65	73.73	9.03	71.36
BARLEY	35.36	89.53	41.75	76.37
WHEAT	.58	96.20	.01	106.00
MIXED GRAIN	5.59	91.03	22.41	67.74
BREW GRAIN (DRY EQ.)	1.69	170.61		
BET PULP	.23	200.96		
DAIRY RATION	90.99	190.59		
CALF FEED	3.22	348.04		
MILK REPLACER	.30	1616.21		
SUPPLEMENT	19.01	326.52		
MOLASSES	.38	301.35		
SALT	.79	260.29		
MINERALS & VITAMINS	2.60	692.49		
SUBTOTAL -----	165.40	31682.04	73.21	5352.94
<u>ROUGHAGE</u>				
ALFALFA HAY	79.80	75.78	181.76	77.49
ALFALFA PELLETS	3.19	146.90		
STRAW FED	.18	23.37	1.43	30.95
GREENFEED	3.77	48.06	3.05	54.19
SILAGE (DRY EQ.)	13.08	74.40	116.54	70.10
SUBTOTAL -----	100.02	7674.15	302.78	22464.47
GRINDING		593.82		
GRAND TOTAL FEED COSTS		39950.01		27817.41
BEDDING STRAW	23.22	29.57	38.38	31.83
AV. PRICE: CONCENTRATE	155.21	\$/TONNE		
ROUGHAGE	74.82	\$/TONNE		
FED PER COW: CONCENTRATE	3.86	TONNES		
ROUGHAGE	6.52	TONNES		
% HOME GROWN: CONCENTRATE	30.68	%		
ROUGHAGE	75.17	%		

APPENDIX C

SOUTHERN ALBERTA

AVERAGE FARM SUMMARIES

SOUTHERN ALBERTA AVERAGE

(22 Producers)

TABLE 1 ***** DAIRY ENTERPRISE COSTS AND RETURNS *****
1990

	TOTAL ENTERPRISE	PER COW	PER HL. SOLD	PERCENT FROM INCOME
INCOME:				
MILK SALES	246131.39	3346.31	48.68	
MILK SUBSIDY	11981.59	162.90	2.37	
MILK LEVIES (-)	-9324.06	-126.77	-1.86	
MISCELLANEOUS RECEIPTS	2091.00	28.43	.41	
NET CATTLE SALES (+)	22568.25	306.83	4.46	
NET INVENTORY INCREASE (+)	3127.93	42.53	.62	
GROSS INCOME -----	276576.11	3760.23	54.71	100.00
EXPENSES:				
GRAIN	13069.12	177.68	2.59	
COMPLETE FEED	26248.95	356.87	5.19	
SUPPLEMENT	3797.08	51.62	.75	
MINERALS & VITAMINS	1297.87	17.65	.26	
ROUGHAGE	39353.24	535.03	7.78	
PROCESSING COSTS	79.37	1.08	.02	
TOTAL FEED COSTS -----	83845.64	1139.93	16.58	30.32
BEDDING AND SUPPLIES	9511.37	129.31	1.88	
BREEDING	1924.52	26.17	.38	
VET. AND MEDICINE	5274.32	71.71	1.04	
MILK HAULING	8425.82	114.55	1.67	
PRODUCER'S FEES	4399.82	59.82	.87	
UTILITIES	7538.30	102.49	1.49	
FUEL, OIL, LUBE	3892.56	52.92	.77	
BLDG. & MACH. REPAIRS	12829.51	174.43	2.54	
TAXES AND INSURANCE	4264.79	57.98	.84	
MISCELLANEOUS	11711.95	159.23	2.32	
TOTAL OTHER COSTS -----	69772.95	948.61	13.80	25.23
HIRED LABOR	27200.51	369.81	5.38	
FAMILY LABOR	29603.60	402.48	5.86	
TOTAL LABOR COSTS -----	56804.12	772.29	11.24	20.54
TOTAL OPERATING COSTS ====	210422.71	2860.83	41.62	
RENT	1397.34	19.00	.28	
DEPRECIATION	21874.38	297.40	4.33	
INTEREST (CAP.DEBT)	9098.85	123.70	1.80	
TOTAL CAPITAL COSTS -----	32370.56	440.10	6.40	11.70
TOTAL PRODUCTION COST ====	242793.27	3300.93	48.02	87.79
RETURN TO CAPITAL	66153.40	899.40	13.09	
RETURN TO EQUITY *	33782.84	459.30	6.68	12.21
MILK PRICE			49.21	
INVENTORY ADJUSTMENT			5.50	
INTEREST ON EQUITY (%)			9.55	
INTEREST ON DEBT (%)			9.03	

* Note: Return to Equity Includes Management.

TABLE 2

**** STATEMENT OF INVESTMENT ****
1990

<u>LAND BUILDINGS & EQUIPMENT</u>		AGE	DEPRECIATION	DAIRY INVESTMENT		
DAIRY BUILDINGS		12.15	7564.46	179975.27		
POWER MACHINERY		5.88	6116.81	41070.26		
DAIRY EQUIPMENT		8.13	6422.42	28825.97		
OTHER EQUIPMENT		5.10	1770.70	9011.28		
TOTAL EQUIPMENT		6.45	14309.92	78907.51		
LAND				47982.27		
SUPPLIES				4580.76		
** SUBTOTAL **			21874.38	311445.81		
<u>DAIRY LIVESTOCK</u>		---BEGIN YEAR---	---END OF YEAR---	AVERAGE		
		NUMBER	VALUE	NUMBER	VALUE	
COWS		73.55	103903.01	74.82	105701.09	104802.05
BRED HEIFERS		18.00	17059.09	18.86	17877.58	17468.34
OPEN HEIFERS		27.23	13861.16	27.91	14208.26	14034.71
HEIFER CALVES		22.50	4653.41	23.27	4813.22	4733.32
BULL CALVES		11.86	1523.40	10.68	1371.64	1447.52
BULLS		.32	364.46	.45	520.66	442.56
** SUBTOTAL **		153.45	141364.53	156.00	144492.46	142928.50
TOTAL DAIRY INVESTMENT		-----				454374.31
CAPITAL LOANS						100790.34
OPERATOR EQUITY						353583.97
INVESTMENT PER COW						6073.05
DEBT/CAPITAL RATIO						.22
CAPITAL TURNOVER (YR)						1.64
-----HERD SIZE-----						
NUMBER OF DAIRY COWS		73.55				
NUMBER OF ANIMAL UNITS		116.51				
DRY COWS (%)		16.58				
CALF CROP (%)		86.89				
PASTURE PER COW (AC.)		1.22				
-----CATTLE SALES & PURCHASES-----						
		NUMBER	SELLING PRICE	NUMBER	PURCHASE PRICE	
COWS		18.68	830.77	.50	1163.64	
BRED HEIFERS		1.86	1102.20	.95	1259.52	
OPEN HEIFERS		.82	730.72	.14	2600.00	
HEIFER CALVES		.77	315.82	.14	3000.00	
BULL CALVES		30.59	190.29	.36	125.00	
BULLS		.95	967.83	0.00	0.00	
TOTAL VALUE		25161.44		2593.18		

TABLE 3

***** LABOUR AND MANAGEMENT *****

<u>LABOUR</u>	HOURS	VALUE	HOURLY RATE	
OPERATOR LABOUR	2267.32	20972.69	9.25	
HIRED LABOUR	2794.36	27200.51	9.73	
FAMILY UNPAID LABOUR	978.05	8630.91	8.82	
TOTAL	6039.73	56804.12	9.41	
RETURN TO FAMILY LABOUR	7.55	\$/HR		
MAN EQUIVALENTS	2.42			
LABOUR HOURS PER COW	82.11			
YEARS FARMING	22.00			
<u>MILK PRODUCTION</u>	HL.	% OF TOTAL	VALUE	PRICE
QUOTA MILK	3733.26	71.07	190294.73	50.97
OVER QUOTA MILK	1299.08	24.73	54279.68	41.78
OTHER MILK SALES	23.27	.44	1147.48	49.31
FED TO LIVESTOCK	197.15	3.75	9582.24	48.60
TOTAL	5252.76	100.00	255304.14	48.60
FLUID QUOTA	1016.36	LITRES/DAY		
QUOTA PRICE	230.51	\$/LITRE		
CLASS 1 UTILIZATION	75.83	%		
BUTTERFAT TEST	3.66	KG/HL		
MILK PRODUCTION PER COW	7141.46	LITRES		
<u>MANAGEMENT FACTORS</u>				
COST PER HL	48.02			
MILK/FEED (KG) RATIO	1.85	LITRES		
MILK/LABOUR (HR) RATIO	86.97	LITRES		
MILK/CAPITAL (\$) RATIO	1.16	LITRES		

TABLE 4

***** FEED REPORT *****
1990

		----PURCHASED----		----HOMEGROWN----	
<u>CONCENTRATES</u>		QUANTITY (TONNES)	PRICE	QUANTITY (TONNES)	PRICE
OATS		0.00	0.00	9.76	75.48
BARLEY		40.74	88.69	37.10	80.25
WHEAT		17.73	134.99	0.00	0.00
MIXED GRAIN		5.59	126.97	9.32	75.59
BREW GRAIN (DRY EQ.)		10.49	173.31		
BET PULP		.71	165.75		
DAIRY RATION		131.43	183.91		
CALF FEED		7.22	259.75		
MILK REPLACER		.11	1771.91		
SUPPLEMENT		11.04	341.77		
MOLASSES		.07	339.95		
SALT		1.05	224.78		
MINERALS & VITAMINS		1.23	862.32		
SUBTOTAL -----		227.40	39994.71	56.18	4418.33
<u>ROUGHAGE</u>					
ALFALFA HAY		77.65	94.75	171.45	83.19
ALFALFA PELLETS		0.00	0.00		
STRAW FED		0.00	0.00	2.76	32.43
GREENFEED		.20	58.00	41.54	57.05
SILAGE (DRY EQ.)		28.03	72.88	165.19	80.03
SUBTOTAL -----		105.87	9410.73	380.93	29942.51
GRINDING			79.37		
GRAND TOTAL FEED COSTS			49484.80		34360.84
BEDDING STRAW		57.10	33.16	32.59	32.28
AV. PRICE:	CONCENTRATE	156.61	\$/TONNE		
	ROUGHAGE	80.84	\$/TONNE		
FED PER COW:	CONCENTRATE	3.86	TONNES		
	ROUGHAGE	6.62	TONNES		
% HOME GROWN:	CONCENTRATE	19.81	%		
	ROUGHAGE	78.25	%		

APPENDIX D

MONTHLY QUESTIONNAIRE

DAIRY COST SURVEY - INVESTMENT

--	--	--	--	--	--	--	--

Name: _____

Year: _____

LOANS

	Owing Jan. 1	Interest Rate	Dairy Portion (%)
Land			
Buildings			
Livestock			
Machinery			

SUPPLIES

	Value Jan. 1		Dairy Portion (%)
Gas, Oil & Grease			
Posts & Wire			
Shavings			
Dairy Livestock Supplies			
Rations & Supplements			
Other Supplies			

Building Site	Acres :			
	\$/Acre :			
Dairy Pasture	Acres :			
	Value :			
Fluid Milk Quota (L)				
Years In Buisness				
% Dairy Income From Total Farm				

OFFICE USE ONLY

	Number	Price	
Cows			
Bred Heifers			
Open Heifers			
Heifer Calves (under 6 months)			
Bull Calves (under 6 months)			
Bulls			

Buildings used for Dairy

	Purchased Price	Years Kept	Dairy Portion (%)

Tractors & Trucks used for Dairy

Dairy Equipment

Other Equipment used for Dairy

DAIRY COST SURVEY

--	--	--	--	--	--	--	--

Name: _____

Date: _____

DAIRY HERD	Beggining	Purchases		No.	No.	Sales		End
	No.	No.	Value	Born	Died	No.	Value	No.
Cows Milking								
Cows Dry								
Bred Heifers								
Open Heifers								
Heifer Calves (under 6 mths)								
Bull Calves (under 6 mths)								
Herd Bulls								

CAPITAL PURCHASES

Specify

Total Value

Dairy (%)

Equipment	Purchases		
	Sales		
Tractor, Truck, Auto	Purchases		
	Sales		
Buildings	Purchases (or completed const.)		
	Sales		
Fluid Quota Sold [] or Purchased []			Litres:

SALES

Private Milk Sales	(Litres)	
	(Value)	
Milk fed to Livestock	(Litres)	
Milk Home Use	(Litres)	
Miscellaneous Income	(Specify)	

OFFICE USE

Quota Milk (L)		Freight	
(Value)		Fees	
Over Quota (L)		Butterfat Test	
(Value)		Utilization	
Subsidy		Levy Refund	
Levies			

FEED	Tonnes Fed	Price if Purchased	Office Use	FEED	Tonnes Fed	Price
Barley				Dairy Ration		
Oats				Supplement		
Wheat				Brew Grain		
Mix Grain				Beet Pulp		
Hay				Alfalfa Pellets		
Silage				Calf Feed (KG)		
Greenfeed				Milk Replacer (KG)		
Strawfeed				Salt (KG)		
Bed. Straw				Min. & Vit (KG)		
				Molasses (KG)		
				Grinding Charges		

LABOUR

Hours

Wages & Board

Operator		
Wife, Partner		
Family Labour	1. (over 18)	
	2. (under 18)	
Hired Labour	1.	
	2.	
	3.	

EXPENSES

Total Farm (\$)

Dairy Portion (\$)

Vet. & Medicine		
Breeding		
Livestock & Barn Supplies		
Building & Fence Repair		
Machinery & Equipment Repair		
Fuel, Oil, Lube		
Utilities		
Insurance & Licences		
Cash Rental		
Operating Loan Interest		
Other Expenses (Legal, Acct., DHI, etc)		

APPENDIX E

ALBERTA MILK PRICE FORMULA

Milk sold for consumption in fluid form in Alberta is priced at the producer, wholesale and retail levels by the Public Utilities Board. This is a common procedure in that, for many years, appointed bodies in Canada and the U.S.A. have issued pricing orders designed to ensure adequate supplies of milk for the consuming public. The orders are made following public hearings at which producers, consumer and industry representatives make submission. All systems incorporate some type of quota allocation among milk producers which, when associated with the first grade milk price, provides the incentive to maintain the flow of milk in the cold winter months as well as in the summer.

Formula Pricing

A modification of the above procedure is known as "formula pricing", whereby an equitable price for first grade milk is determined through the use of selected statistical indicators. As milk is considered an essential food in the modern diet, the interests of consumers as well as producers must be considered in the pricing mechanism. Thus an "economic formula", incorporating supply and demand components, is normally used to determine the producer price.

Formula Development in Alberta

In 1973, the Production Economics Branch designed a formula process to permit a comparison with milk price levels over the previous ten years. It was adopted for experimentation over a 12 month period from August, 1973 to August, 1974. Upon presentation and discussion of the results at a hearing in Red Deer in August 1974, the Public Utilities Board ordered the Formula to be used as a pricing mechanism for a test period of one year starting in October, and to be accompanied with a cost of production program to monitor its suitability and to assess adjustments in the formula components if required at the end of the period.

The Alberta Formula

The Alberta Formula consists of seven statistical factors or components. The first five represent the producer's major cost components and return, and therefore are a reflection of his willingness to sell. The last two represent the approximation of demand of the consumers. The weight given to each factor was established with reference to the actual cost structure on the supply side and relative demand elasticities was a guide for setting the weight of the demand side.

TABLE 1
Components of the Alberta Formula

Components	Weighting
1. Price of 16% Dairy Feed \$/Tonne (Alberta)	14
2. Price of Alfalfa Hay \$/Tonne (Alberta)	14
3. Index of Farm Wages (Western Canada)	12
4. Index of Farm Inputs (Western Canada)	20
5. Index of Consumer Prices (Canada)	10
6. Average Weekly Industrial Wages (Alberta)	16
7. Per Capita Sales of Milk Litres/Month (Alberta)	14
COMPOSITE	100

Application

A base price of \$21.04 per hectolitre for No. 1 milk was established as at August, 1973. This was determined from the results of the 1973 Dairy Cost Study and provided for a return of 15 per cent on sales income. The indices for the month of August, 1973 were converted to 100, which was then equated to the base price of \$21.04. Subsequent monthly index conversions were then calculated relative to the base month, and subsequent monthly producer price levels were determined by multiplying the base price by the appropriate "combined indices".

Whenever the present Formula states a change of \$0.49 per hL above or below the existing No. 1 producer price, the Public Utilities Board may make an adjustment of \$0.98 to the producer and one cent per litre to the consumer.

Changes in the Formula price are calculated monthly by the Production Economics Branch and are forwarded to the Public Utilities Board in time to allow for notifications and price list adjustment by the milk processing firms for the succeeding month.

The current formula will be kept under observation and, subject to results of the cost study and observed statistical trends, will be reviewed from time to time.

PRODUCTION ECONOMICS BRANCH
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